250509 Meeting Minutes

Attendees: Kate Malecek, Linda Mondaca, Alyssa Player, Jaasiel Alvarez, Ben Ben, Annie Lam, Dennis Ko, Tasha Cammidge, Raj Mukkamala, Luisa Segovia, James Linton, Cate Holmes, Pavee Vasna, Chris Kalaw, Maddy Murphy, Alexander Cohen.

- This month, RSVP here to order food from Catering Menu for Corder Bakery Café! In your RSVP, please type in the meal you would like and all the details for the order. **The deadline for submitting your food order is Thursday 9am.** I will also bring a kettle so we can boil hot water and I will bring some yummy hot chocolate packets and tea bags for folks to enjoy! If you prefer, BYOT. **Please remember to bring your laptops.** For bonus sustainability: folks can bring their own cups and/or utensils and/or plates as an alternative to our usual compostable ones!

    - Ordered 1 day in advance, lots of options for single orders or bulk orders
    - $25 delivery fee, but WAY cheaper than DD
    - BUT plastic!!! Lots of plastic in the individual meals ☹

Will update Restaurant Guide and our Coffee, Breakfast, and Dessert Guide

Introductions …

Million Advocates for Sustainable Science Petition

- International Institute for Sustainable Laboratories (I2SL) along with My Green Lab are petitioning to change funding granting agency policy to promote sustainable research
- By signing the letter you can help transform how science funding organizations set expectations for efficiency, resiliency, and sustainability in the way scientific research is conducted
- Reached 1100+ signatures!

Green Labs Monthly Tip: Sustainable Procurement

1. CHECK if your products have return programs for packaging (including Styrofoam), if products are recyclable after use, if TechMart recommends these products as “green” (indicated by a green leaf near the product), or if they have an ACT LABEL (a label that provides clear information about the environmental impact of a product).
2. CONSIDER swapping the products you commonly order to sustainable options (if needed, reach out to vendors to see if you can get price-matching discounts!)
3. COMPARE equipment choices see if: there are “eco-friendly” modes which reduce energy consumption; items have more sustainable consumable options; a longer average lifespan; fewer maintenance requirements; or if the end-of-life recyclability of an item is environmentally friendly.
4. REDUCE the number of purchases you make by minimizing the size of experiments, or collaborate with a neighbouring lab to reduce the number of orders.
5. INVENTORY supplies and equipment to ensure you are not over-ordering, and establish an easy system for labs to order common goods. Also check out the Green Labs Marketplace (Glassware/Equipment/Chemical share program).
6. Check out the resources on our Clean Up Event page on specific topics to help keep your lab organized and efficient, including recycling signage, chemical inventory spreadsheets, mock order sheets, or sustainable products list.
7. We are also making available digitally fillable inventory sheets or blank printable inventory sheets for freezer inventories. We recommend laminating these sheets or putting them in a sleeve protector to keep them clean and legible.

8. You can search for or divest lab items such as surplus supplies, chemicals, equipment, furniture, and more with our new (beta) Green Labs Marketplace!
9. Check out our Lab Spring Clean Event webpage for more tips and tricks to keeping your lab safe and clutter-free!

Updates

- **26 Certified labs!! WHOOOOO**
    - Please get CERTIFIED TODAY! To get certified, finish the easy, 30-minute Green Labs Certification and submit it to sustainability@caltech.edu.
    - Certified Labs-exclusive event planned for April!

Updates – Pilot Programs

- FUNDING IS AVAILABLE – SEE PILOT PROGRAMS WEBSITE
- Lomi Composter Pilot (8 on campus): 521 kg of dirt (2603 kg (or 5738 lbs!) food waste)
    - Donation of a whole Lomi! Set it up in the Facilities building – our first OFFICE Lomi!
- Pipette Tip Box Recycling: 2,775 pounds (5842 gallons or 22,113+ liters) of plastic waste diverted EXPANDING PROGRAM!
- -70˚C/-80˚C Comparison Pilot: 5 labs involved, collaborating with NIH and UVA + Norway labs collaboration
- PolyCarbin: Initial order replaced 31 pounds of crude oil and reduced 122 pounds of CO2E via sustainable procurement
    - AP: sent off another box of coloured plastic, 34 lbs of plastic recycled, 12,793 water conserved, 70 lbs carbon emissions reduced
- Styrofoam recycling pilot
    - DIVERTED 25 DUMPTSTERS total!!
    - Sign the petition!
    - Technical bulletin from I2SL
    - LCA of Styrofoam
    - How to do LCAs
- Fume hood sensor project
    - Around $1,300 savings per fume hood on average!! GG writing up now for our 21 fume hoods
- **Grenova pipette tip washer:** looking into funding options!
    - Survey for pipette tip types, cost per year, etc. to gather data
    - Looking into funding options
- **Follow us on Instagram** →

Updates – Past Events

- This past month:
    - May 7 – Styrofoam recycling day
        - Changed location of Chen dropoff to 3rd floor
    - Clean Up Event January – April 2025
    - Earth Month Programs!!
        - **Resource Fair April 22!**

Updates – Future Events

- Coming up:
- BBE Spring Town Hall presentation – May (TODAY)
- Lab manager meeting presentation May 16
- Re-Engagement Certified Labs Competition Begins in April! - ***Now deferred to July!
- Presenting to AALAC group June 16
- Clean Up Event January – April 2025
- Hosting SURF summer students – Dennis Ko?
- 2025 Freezer Challenge– next year make a higher priority!
    - January 1 – July 1
    - Labs compete to improve freezer efficiency, sample accessibility, reduced risks, cost-savings, and energy-savings for their lab's cold storage!
    - Fun, free program
    - Scored on different categories (like defrosting freezers or inventorying)
    - Awards given at I2SL for the winners!
    - Will provide internal prizes, AND a popsicle party in the summer!

Presentation by Chris Kalaw – new Recycling and Materials Coordinator!

- Earth Week
    - Community composting event
    - Earth Day Resource Fair! Making this an annual event
    - Plant-Based Food Sampling Event
        - HUGE crowd pleaser
        - MM: had a lot of fun and would do again!
    - I2SL Resnick Tour
- Styrofoam Program
    - Changing from Green Labs to Recycling Team
        - Want to get permanent bins for Crellin and other locations, but working with vendor to see if they will haul it for us, which will reduce costs and justify the cost of permanent program and permanent bins!
        - Should know by next month
        - Want also to expand to new buildings?
    - Costs $272-$538 / month currently! Diverted 25+ dumpsters!
    - Sending out a poll for building managers next week

- Lomi Program
    - Changing from Green Labs to Recycling Team
    - Green Labs donated a Lomi to Facilities
        - Underutilized, so finding new ways to encourage users, maybe expand to include other groups or buildings including service center, OR could change to Blacker Student Housing instead?
    - TS: what does the program look like moving forward?
        - CK: want to change how users interact with the program, right now we are producing a lot of compost with the current program that can't be used as we

make too much, so perhaps integrating into the Catalina system, want to see if we can expand across campus but need to determine if that is reasonable; we are sending a lot of it through our hauler's compost program
    - KM: have audits been done on waste bins? Especially compost waste bins that already exist on campus?
        - CK: There are 3 compost waste bins currently all associated with kitchens, so those folks train to use, and sometimes students from housing will contribute
        - CK: no waste audits have been done, something to do in future
- Social media!
    - Want followers, so find us @caltechgreen and follow us, trying to produce content every week to keep everyone up to date
    - Any suggestions?
        - JA: Could show us the recycling yard
        - LS: could put procurement stuff on there, including desks, chairs etc from marketplace
- Recycling: A glimpse into the behind the scenes work on campus
    - Sharp decrease in recycling costs when we switched haulers
    - Better materials recycling capabilities now with new team since October
    - More agile team
    - Helped develop the Sustainability Report

	Q3 FY24	Q4 FY24	Q1 FY25	Q2 FY25
Total Trash Cost	$134,821.09	$137,409.28	$135,973.82	$144,800.43
Total Recycling Revenue	-$36,060.08	-$37,619.64	$2,813.21	$3,262.89
Net Material Cost	$170,881.17	$175,028.92	$133,160.61	$141,537.54

    - May be able to use the increasing revenue to fund new programs including Styrofoam program!
- New Projects
    - Sustainability procurement working group
        - Focusing on Scope 3 emissions
    - Sustainability Events
        - What would people like to see?
        - JA: tour of the Holliston yard
        - MM: more food events
        - JL/KM: how to recycle on campus, especially lab wastes
    - Lab cleanouts
        - Results and reducing the amount wasted (BIG focus of 2025!), partnering with groups to divest old chairs and desks etc

        - Want to see an increase in our diversion rate- currently ~10% but other universities are around 60%
- Scope 3 Emissions
    - Upstream includes: purchased goods and services, capital goods, fuel and energy related activities, transportation and distribution, waste generated in operations, business travel, employee commuting, leased assets
    - Downstream includes: transportation and distribution, processing of sold products, use of sold products, end of life treatment of sold products, leased assets, franchises, investments
    - Want to tackle "low-hanging fruit"
        - Tackling purchased goods and services especially (in order of spend from high to low):
            - Facilities Group
            - IMSS
            - Student Auxiliary Services Group
            - Student Affairs Group
            - Athenaeum Group
        - ~$13.85 M / year!!
    - What is the Divisional representation? (in order of spend from high to low)
        - Physics, math, and astronomy
        - Biology and Biological Engineering
        - Engineering and Applied Science
        - Geological and Planetary Science
        - Beckman Institute
        - Humanities and Social Science
- Contact Information
    - Phone: (take me to dinner first)
    - Email: ckalaw@caltech.edu
    - Website: sustainability.caltech.edu
        - Sustainability Report
    - Social media: @caltechgreen

- Questions?
    - KM: what is the most difficult thing to overcome with this new role?
        - CK: setting my expectations too high, I want everything to happen FAST and it does not here at Caltech
    - DK: What is happening to the Styrofoam project? Bin for Crellin?
        - CK: depends on what we hear from our hauler, and if we can make a case for making it a permanent program, doing some tricky numbers negotiations but will hopefully know by the end of the month if the program will be able to continue
        - TC: but that's the hope! That the program will continue and that we can make a case, and then we would purchase bins for all locations that would be "iconic" and useful for facilities
    - TA: Are you working with facilities to change their workflows to ensure they are recycling the materials we separate?
        - CK: not yet, but plan to! (*writes down*)

Updates from Clean Up Event

- REALLY cool responses! Saw 7 labs participate, each one did some very cool things
- Highlighting the Flow Cytometry Group, who found some awesome things and shared a slide deck of their clean up!
- TC: will update the website with new photos, but 2 labs asked for an extension so will wait until the 16th to post them 😊

I2SL LabSavers Initiative

- I2SL used our program and CU Boulder's program to make an online resource, and they would like feedback. Since we just did cleanups, is anyone willing to read through and provide them feedback?
    - JA: sure!
    - TC: will post in minutes and in email on Monday

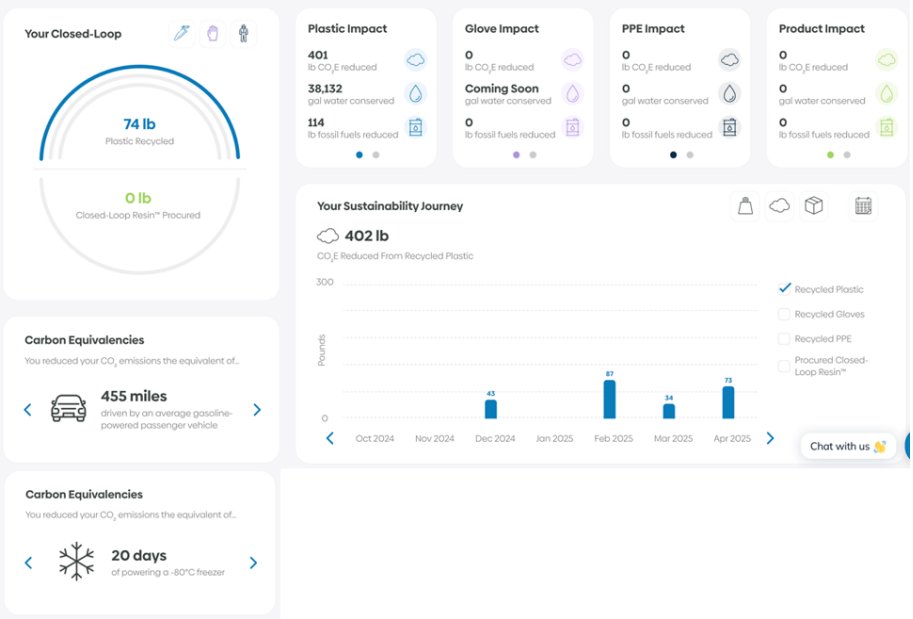
OK, see you next time June 13th and excited to hear from Kate Malecek about ACT labels!!

Notes from Last Meeting

PolyCarbin Update – Alyssa Player and the Beacon Center

- What is it?
    - Founded in 2020 by two physician scientists at the University of Pittsburg School of Medicine
    - Circular economy for scientific plastics
    - Circular economy: recirculates materials so they can be remanufactured and re-used
    - Products /mail-back services can be found on VWR / Thermo Fisher catalogues
    - Beta Carbin program: "Recycle all lab plastics in just two bins"
    - (85% recovery rate of recyclable materials)
- Steps
    - **Fill:** Collect used lab plastic in your Carbins™.
    - **Ship:** Seal and return with our prepaid shipping label.
    - **Track:** Monitor your impact with our Carbin Counter™ (QR code).
    - **Repeat:** Maintain the closed-loop cycle.
- What goes inside?
    - Plastics that have not come into contact biohazardous materials
    - Not branded, just dependent on plastic identification

- Cost / Rotation of the Boxes
    - The boxes are sold by VWR
    - Clear plastic recycling box - **$70/ea** ($350/bulk pack of 5)
    - Colored plastic recycling box - **$86/ea** ($430/bulk pack of 5)
    - Nitrile glove recycling box - **$161/ea** ($805/bulk pack of 5)
        - Consider how many gloves can fit!
        - Limit of 45lbs or so
    - One pack of five has lasted us (+ more recently the PEC) 6-7 months.
        - 1 box per month, in recent rotation
- Carbin Counter
    - As of Apr 2025:
        - 74 lbs of plastic recycled
        - Reduced 402 lbs of CO_2 emissions
        - 6 boxes recycled so far since June 2024
    - Coming soon:
        - Nitrile glove recycling
            - Set up the box last week!
    - Polycarbin also provides information on how they calculate the performance indicators
    - **Climate change reduction**
        - 1 kg of Polycarbin's Closed-Loop Resin™ made from recycled rigid plastics reduces emissions by 96% to 86%, a net reduction of 4.837 - 4.931 $kgCO_2eq$ (carbon dioxide equivalents)



- Questions:
    - TC: Serological pipettes with filters can be recycled?
        - KM: YES, we've checked!
    - TC: How many lbs can fit in a box?
        - KM: varies by type but there are weight restrictions on the box, can make sure the boxes are filled efficiently by stacking or combining particular kinds together etc
    - JA: talking with Chris and he wants to make this a larger program

<u>Flip Book Presentation – Jaasiel Alvarez</u>

- See slides on Drive
- Doc link here for writing and prep
- Went through the formatted flipbook we are sending to EHS etc. for review and got good feedback
    - AP: for page 9-10 which green tip format is better?
        - LS: both are good, but perhaps change colour of the boxes to make them different?
    - KM: add codes for water purity (page 13) info
    - AP: confusing to have "do not recycle" information int eh recycle box and in the bottom "not recyclable" box?
        - Group agreed it is confusing, AP will work on reformatting it!
    - KM/VK: for slide 17 make the top portion divided up like the bottom, too text heavy! Could make office supply and food section, right-size and inventory or single-person ordering or something like that
    - TC: will finish modifying and then send to EHS etc for review!!

<u>Grenova Update</u>

- Proposal for the ZYMO-OTTCP presented to the group, presentation on May 2

- Please read the abstract and send Kate Malecek (kmalecek@caltech.edu) an email with any feedback by April 16!

Plans for 2025

- Presentations by one of us each session?
    - List of topics?
        - AP: make a document online and nudge people at meetings to sign up
    - Subgroups?
    - Project leads?
    - [Could be used for petals for the Certification Re-Engagement!]
- Alternate working-group or presentations?
    - OR every 6 months an overall update / best practices etc
    - Other months we do normal formats?
    - KM: working group is important, alternating sessions could have a good mix
- Q&A sessions with Chris/GLC?
- Monthly tips?
- Pilot project updates?
    - VK: for pilot projects, could we have a way to determine next steps, deadlines etc, a framework that is formalized that can be used to expand our ideas etc?
        - VK: for example, I want to set up a link for the GL Marketplace on the GL website, but delayed until the meeting to bring up, if we had a timeline that would have made me do this earlier!
        - KM: could use project management software, show where we're at, who's committed to help
        - JA: mini working sessions are helpful too, sometimes decisions are made behind the scenes but would love to see more visibility on decisions that are made with a larger group
- Programming/events – social media
    - AP/JA: more social media engagement
        - AP: scheduled posts instead of emails may attract other people
    - GG: could start going to undergrad club fairs especially in the fallish
- Lunch?

Expectations of the FT Green Labs Coordinator:

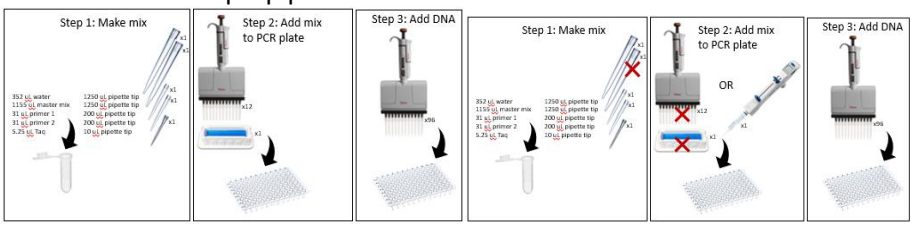
- Fume hoods (and other programs to reduce energy and water use)
- Recycling programs (esp. with RMC Chris Kalaw)
    - TA: really exited to see updates on general recycling
    - TC: CK has agreed to give a talk about this next meeting!!
    - VK: grow Lomi program?
        - TC: Yes, but CK is taking over this project
- Certification program
- Integrating GL Reps into Safety Officer roles?
- Purchasing initiatives
- Collaborations with EHS, especially chemical hazards removal initiatives and Marketplace expansion (related to purchasing)
- Collaborations with Safety, teaching laboratories, and onboarding programming/education
- Coordinate SURF/internships for GL/sustainability

- What do you want to see?
- What support do you need?

- Questions:
    - KM: do you think you will face extra steps or hurdles with facilities?
        - TC: I hope not, though with the funds that we have I suspect we still will be able to do pilot programs independently, then take it to the facilities folks, also facilities may give more support to do the larger projects like the fume hoods (they already agreed this is a priority!) so that will be helpful rather than doing it all on our own

NOTES FROM LAST FEW MEETINGS

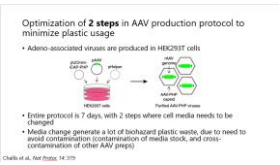
Waste Audits: Protocol Audits (from last time)

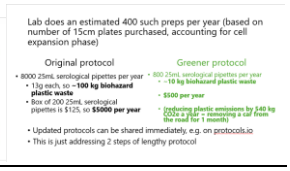
- TC modified a PCR prep protocol like so:
- 

Item	Old	Old x 20 x 52	Plastic waste (g)/year	Cost	New	New x 20 x 52	Plastic waste (g) / year	Cost
2 ml tube	1	1040	1175.2	41.6	1	1040	1175.2	41.6
PCR plate	1	1040	20696	2194.4	1	1040	20696	2194.4
1250 uL pipettes	2	2080	1489.28	62.4	1	1040	744.64	31.2
200 uL pipettes	14	14560	3800.16	436.8	2	2080	542.88	62.4
10 uL pipettes	97	100,880	13164.84	3024	97	100,880	13164.84	3024
Repeater pipette	0	0	0	1383.2	1	1040	2840.24	1383.2
Reservoir	1	1040	9002.24	592.8	0	0	0	
		Totals	49,327.68	$6352			39,163.80	$6736.8
		DIFFERENCE					-10,163.88 g	+384.80
		Emissions (~6 kg CO2 emissions per 1 kg plastic):	295,966.08 g CO2				234,982.8 g CO2	
		DIFFERENCE					-60,984 g CO2	(=removing 1 car from the road for 5 days!)

- shows cost increase (slight!) but LOTS of carbon emission and plastic savings!
- 6 kg CO2 emissions per 1 kg plastic
- (Removing 1 car from the road reference)

Another lab sent us this:





- Showing both cost savings and CO2 emissions and plastic waste and hazardous waste savings!

- **TC created a tool for doing a waste audit, would like help working out kinks, will post on Drive? Go over next month?**

    - AP: use “space” not room on the sheet

- **TC created how-to guide, could make part of the Clean Up event, ask for help editing! Will post on Drive, go over next month?**

END OF MEETING

From last time(s):

Green Event Initiative

- Maybe launch this in 2025
- Some good program examples include UCLA and Yale

- Carbon counter
    - GG will try to build
        - Has chips with different colours, and labels for each city/street to determine distance, each slot is a different method of commute (walk, bike, car, etc).
    - **GG would like help if anyone is interested!**

Waste Audits Initiative

- What are waste audits?
    - Recording what is in waste bins, recycle bins, solvent waste containers
    - Record what is wasted after a protocol or kit
        - Would love to have a lab offer up a protocol and see if we can modify it
        - Volunteers?
        - KM: able to bring bead cleanup protocol for next time – uses a lot of tips!!
    - For example: my lab does PCRs and we aspirate water THEN master mix, so we can reuse the same tip (which halves our tip usage for the master mix prep!)
    - We also reuse conical tubes for reagents, and repeater pipette tips for aliquoting reagents
    - CC: capturing air pollution? Emissions, water, air, soil, lab waste from experiments

    - KM: power meter initiative; green chemistry related to solvent substitution, and reduce pollution
- Why conduct waste audits?
    - Understand volume of waste and determine priorities, or target specific protocols etc, determine what we can change
    - Can be useful to show your lab if they are properly recycling, and determine why things are not being recycled and adopt signage, different sized bins, etc. to help make it easy and simple to recycle properly
        - If recycling bins are too contaminated with non-recyclables, custodial just tosses the whole bin!
        - MIT study
    - Change how we purchase
        - Can contact our suppliers and ask for alternatives with less waste, or that are more recyclable eco-friendly
    - Reduce packaging and shipping
        - Consolidate orders/suppliers within the lab or between labs
        - Purchase in bulk
        - Right-size purchases
        - Reuse packaging like coolers
    - Collaborate with other labs or universities to see if they have alternatives that create less waste, share our best practice tips
        - Research and find alternatives (for example, replacing single-use plastics with glassware)
    - Recycling waste
        - Including solvent waste recycling or plastic recycling!
        - Kimberly Clark, Terracycle, and Medline all offer **glove recycling programs.**
        - Corning offers flexible **package recycling programs.**
    - VK: encourage labs to stop wasting so much
    - MM: SAVE MONEY
    - KM: can we have the new Materials and Recycling Coordinator come give a talk?
        - TC: will ask! Great idea! Maybe for Feb or something?
- How to conduct a waste audit?
    - KM: 2 ideas from above: protocol adjustments and waste streams, labs are more likely to do waste stream ones, so we focus on that for now
    -
    - Step 1: Inform custodial and lab of the effort
        - Waste audit template form
        - Example checklist
        - KM: how much time? Talk to custodian and lab, record for 1 day or 1 week, context of lab cleanup at that time could calculate cost of things they are throwing away esp expired reagents that are over-ordered (page 1)
    - Step 2: Keep waste for a day/week/protocol
        - VK: Broad categories, 3 bins or 5 bins, gloves, plastics paper (page 2) during event (within reason, for biohazard bins can estimate) so all waste from those categories goes into those specific bins and weigh it afterwards
        - OR divide out the waste from each category (recycling, trash, hazardous waste/solvent waste, etc.) and track
    - Step 3: DOCUMENT (photos?)

        - DK: do folks use inventory systems? If you have overbought, don't find it you buy more, so focus on right-sizing protocols or purchasing
        - KM: no pattern of expiry dates for reagents, no "smell test" if something is expired if it will work, asking manufacturer for evidence of expiry
        - MM: OLAR sends back food that has short expiry date and get new, ask for at least 3 month date or something like that, incorporate into purchasing procedure?
    - Step 4: Tell lab of the results
        - What to do with data?
            - Recommend reuse where possible
            - Refuse (consolidating orders, talking with vendors about wastage)
            - Recycle (use tipone etc that have recycling programs on campus OR products that are able to be recycled)
            - KM: provide for spring cleanup, opportunity to advertise for programs we already have and GL guide etc., if complete it they can come to the lab cleanup party, give us data too on brands of gloves and tips etc. aspects of recycling policy, filing things incorrectly, data about behaviour compliance , bring to EHS that they don't know how to recycle
    - Work with members to offer recommendations
        - VK: Where do you think you can reduce volume of waste for your lab? Make a summary page on the site, post ideas, lessons learned and what do you think other labs could benefit from (ethanol prep)
        - MM: "Tips for tips" "More tips for Less Tips!" (VK)
        - Can also update our recycling signage
        - Suggest lab meeting updates / QC / Check-ins
        -
        - Some other resources:
            - University of Bristol Plastics Guidance
            - Article – Reducing Plastics in an Microbiology Lab
            - Article – UCLA Lab Waste Survey
    - Can we create a protocol / resources to help labs conduct one? Do we want to?
        - Yes?! TC will work on making a document for next time
        - TC and KM will bring protocols that we can examine and see if there are ways to optimize
        - KM: tie into the cleanup event?
        - KM: will let us use the data they send (if they send us pictures) on what brands folks purchase etc.

Fact Sheets Updates

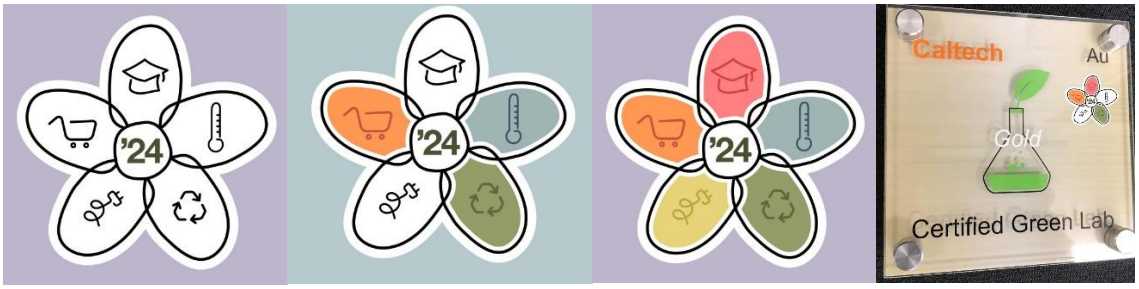
- Rough drafts will be posted to the Drive for:
    - Energy Vampire *
        - Lynchpin fact sheet?
    - Energy Star
        - KM: like the upright version of the graph, it is easier to read
    - Fume Hood
    - Recycling

- Cold Storage
- Purchasing
- TechMart Green Designation

- Spent rest of time working on engagement resources
- KM: make sure we say that it is from the Survey, adding to website
- KM: bring the posters to the LT event and have people vote!!

<u>GROUP WORKED ON ENGAGEMENT PROGRAM AS DIRECTED BY KATE MALECEK</u>

- STICKERS!!
  - MS presented ideas to the group, pictures below



- From last meeting:
  - TS: very cute
  - TC: can even use sticker paper we already have to print them
  - MS: will have the one with the white background be the main sticker, then add coloured patch stickers as requirements are met for each category (5 from previous meetings, including education, cold storage, recycling, energy efficiency, purchasing)
  - MS: modelled after the original GL logo designs
  - TC: is this motivational? – group nodded YES
  - CH: what happens when you get all 5? Could make the middle sparkly or gold or something
    - TC: or holographic!
  - MS: yes, the middle could definitely be used, it is boring now
- From this meeting:
  - BB: website mods for each leaf (have each leaf and a definition on the website)
  - AP: have a leaf for every event, add it to the poster or something
  - DK: helmet stickers from football players helmets
  - KM: also in the future can give “stickers” for each lab website, put on our website too etc.
  - KM: perhaps once launched, we have a deadline for changes, announce winner of “Most Changes” or “Best Lab” or something at certification party
  -